

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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# MULTIMEDIA UNIVERSITY

## FINAL EXAMINATION

TRIMESTER 3, 2017/2018

**PBM0054 – MATHEMATICS**

(Foundation in Business)

4 JUNE 2018

2.30 p.m. – 4.30 p.m.

(2 Hours)

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### INSTRUCTIONS TO STUDENT

1. This question paper consists of 2 pages with **FIVE** questions.
2. Attempt **ALL** five questions. The distribution of the marks for each question is given.
3. Please write all your answers in the answer booklet provided. All necessary workings **MUST** be shown.

**Question 1**

a. Simplify  $\left(\frac{3y^{-1} + 4x^{-1}}{9y^{-2} - 16x^{-2}}\right)(27x^3 - 64y^3)$ . (8 marks)

b. Simplify  $\frac{[h^4 j^{-1} k^4]^3}{(2h^{-3} j^{-4} k^{-2})^{-2}}$ . (4 marks)

c. Solve  $\sqrt{17y - \sqrt{y^2 - 5}} = 7$ . (8 marks)

d. Find an equation of the line  $L_1$  that passes through the point  $(3, -7)$  which is perpendicular to the line that contains the points  $\left(\frac{1}{2}, 3\right)$  and  $(5, 0)$ . (5 marks)

(Total = 25 marks)

**Question 2**

Solve for  $x$  of the following equations.

a.  $\log 4x^4 - 2\log 2x = \log(x + 2)$  (7 marks)

b.  $\frac{4000}{2 + 7^{3x}} = 5$  (5 marks)

(Total = 12 marks)

**Question 3**

Solve the following system of linear equations using the inverse of coefficient matrix.

$$x + y + z - 6 = 0$$

$$2y + 5z + 4 = 0$$

$$2x + 5y - z - 27 = 0$$

(13 marks)

(Total = 13 marks)

**Continued...**

**Question 4**

- a. Find  $\frac{dy}{dx}$  for the following functions and simplify the answers.

i.  $y = 8x^9 - \frac{2}{15x^6} + \frac{3}{\sqrt[5]{x^4}} - 12$  (3 marks)

ii.  $y = 4\left(\frac{1}{6}x^4 + 5x^{-2} - 2\right)^{-3/2}$  (3 marks)

iii.  $y = (5x^2 - 1)(-x^2 - 3)^4$  (5 marks)

iv.  $y = \frac{(x^3 + 4)^3}{3x^4 - 2}$  (5 marks)

- b. Given that  $f(x) = (4x + p)(x + 3)^2$ , where  $p$  is a constant, find the value of  $p$  if  $f'\left(\frac{1}{2}\right) = 13$ . (4 marks)

- c. If  $w = (5x + 6)^3$  and  $x = \frac{s+1}{s-1}$ , find  $\frac{dw}{ds}$ . (5 marks)

(Total = 25 marks)

**Question 5**

- a. Integrate each of the following integral.

i.  $\int x^{\frac{3}{2}} \left( -\frac{2}{3}x^3 + \frac{1}{x} \right) dx$  (3 marks)

ii.  $\int_0^2 \frac{x}{\sqrt{5x^2 + 4}} dx$  (6 marks)

iii.  $\int 16x(\sqrt[3]{(2x+5)(2x-5)}) dx$  (6 marks)

- b. Given  $\int_0^1 k(9 - x^2) dx = \frac{1}{12} + k$ , find the value of constant  $k$ . (3 marks)

- c. The marginal price for a weekly demand of  $x$  bottles of shampoo in a store is given by

$$P'(x) = \frac{-6000}{(3x + 50)^2}.$$

Find the price-demand equation,  $P(x)$  if the weekly demand is 150 when the price of a bottle of shampoo is RM8.00.

(7 marks)

(Total = 25 marks)

**End of page**